

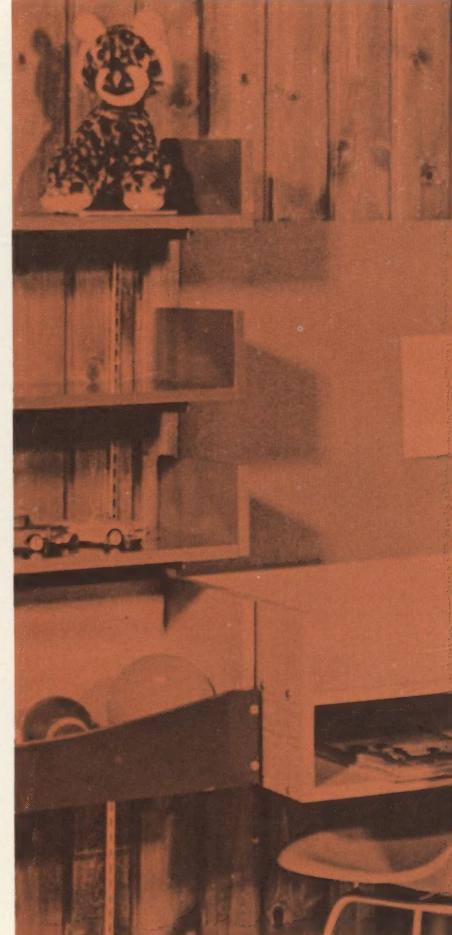


# CREATE USEFUL NEW INDOOR STORAGE





## 2 INDOOR STORAGE



Lack of proper storage facilities is a common problem in this era of expanding families and growing leisure time. Happily, it's easily within your power to correct this situation and gain increased storage space within the walls of your present home. This booklet is intended to help you do this correctly. After reading through this introductory material, look over the pictures to get ideas for the type of unit or units you may be interested in for your own personal storage needs. You will note there are many types, shapes, and sizes of storage facilities pictured, but all will include some of these basic components: shelves, cabinets, drawers, doors, etc. Because everyone's storage needs are different, detailed instructions of the storage units pictured have not been provided; instead, this booklet tells how to build those basic components essential to all storage units. You can easily adapt the dimensions of these components to your own storage units. Consult index on page 3 which lists projects and construction details provided.

This booklet is intended to give you ideas, and to assist you in building your own units. Doing-it-yourself not only saves money, but is also a source of great satisfaction for a job well done. To best achieve this, select your lumber carefully. You find that wood from the Western Pine Region always provides complete satisfaction. These woods are ideal for the home craftsman because they are the finest working woods in the world. They have great advantages over plywood and other wood species because they always saw easily and evenly without splinters and ragged edges, they accept a nail close to the edge without splitting, they will sand satin smooth, and being thoroughly seasoned they will resist warping, binding, turning or splitting. When you consult your lumber dealer on species, grades and sizes of lumber for building your storage facilities, ask him about Western Pine Region lumber. He'll confirm the advantages of these woods—seasoning and unmatched workability.



## INDEX

### SHELVES 4

How to install standards (vertical supports) ■ Methods of attaching shelves to standards

### CABINETS 5

Framework and siding ■ Construction details of simple cabinet ■ Use of adhesives ■ Types of joints ■ Example of complete storage unit

### DRAWERS 6

Importance of exact measuring ■ Types of drawer joint construction ■ Construction of lip-front drawer ■ Types of guide strips and construction

### DOORS 7

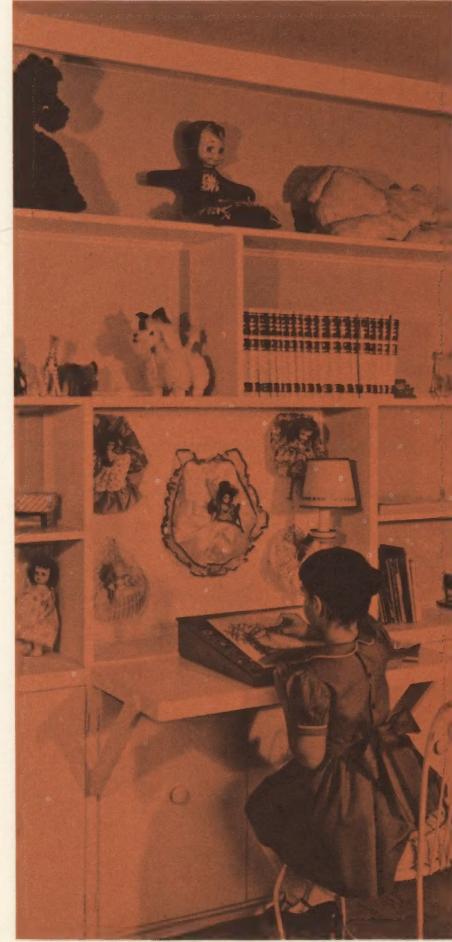
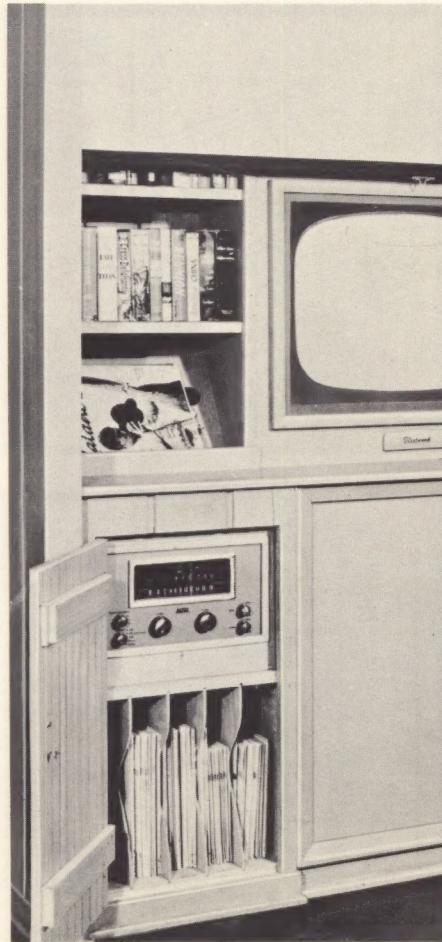
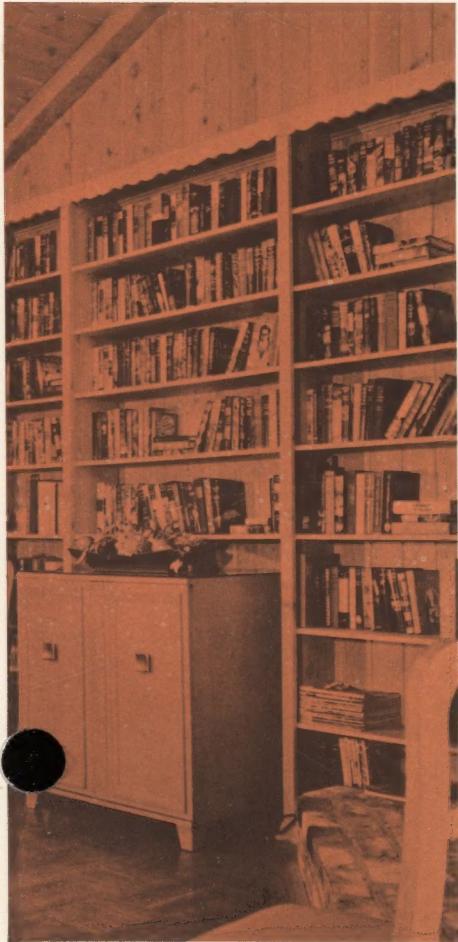
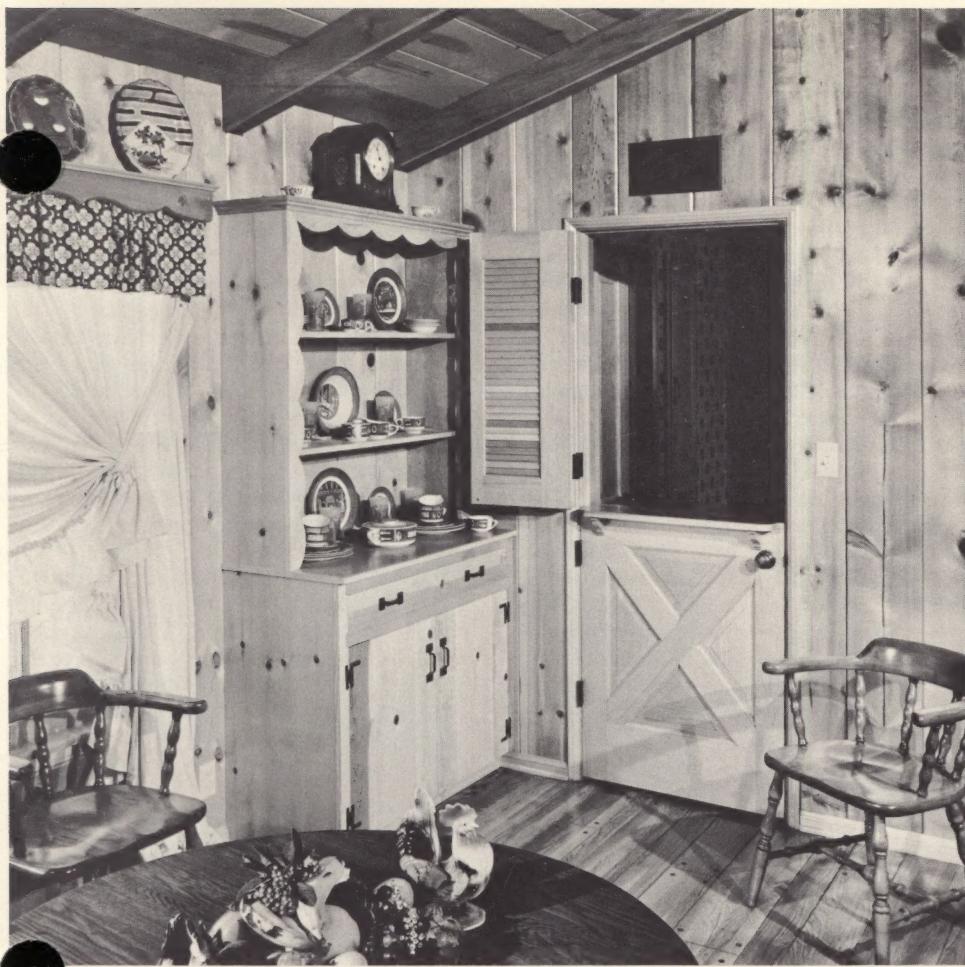
Necessity for doors in cabinetry ■ How to construct door panel ■ Types of hinges ■ Sliding doors

### PARTITIONS 7 and RACKS

When and where to use them ■ easily constructed ■ some examples.

### FINISHING HINTS 8

Use of mouldings to dress up cabinets ■ Concealing defects ■ staining ■ lacquering ■ Should you paint?



One of the simplest forms of storage is shelving. You may want to add shelves in an existing closet to give you additional storage, build them to store and display your books in a living room or den, or build them in a cabinet you are about to construct.

The basics of shelving are vertical supports (standards), horizontal members (shelves), a means of attaching shelves to standards, and a method of attaching standards to wall.

In affixing standards to the wall, there are two types of installation to consider. One is that in which the shelf will extend from wall to wall. To construct this merely put your standards in place by fastening them against the wall with toggle bolts (see Sketch 1).

The other is where one—or both—of the standards is attached only to the wall forming the back of the shelving. The easiest, safest, and neatest way to secure this type of shelving to the back wall is by

purchasing a metal standard brace at your dealer's and fastening it to the wall with toggle bolts as indicated in Sketch 2. The standard is then fastened inside the brace with wood screws as indicated.

There are many ways to attach shelves to standards, and some of the most widely used methods will be discussed here. The simplest method would be to drive nails through the standard into the end of the shelves. However, this method is not particularly strong and is not recommended for shelves carrying any load. The most secure, and a very professional, method of building shelving is by dadoing (cutting grooves in) the standard. See example in Sketch 1. Cut the dado the thickness of the shelf with a dado blade on a power saw or else use a dado plane. Remember to cut the dado before the standard is secured to the wall. Then the shelf is fitted into place and held by glue and nails. Lacking dado-cutting tools, you may use a substitute method which resembles dadoing. This is indicated in Sketch 3.

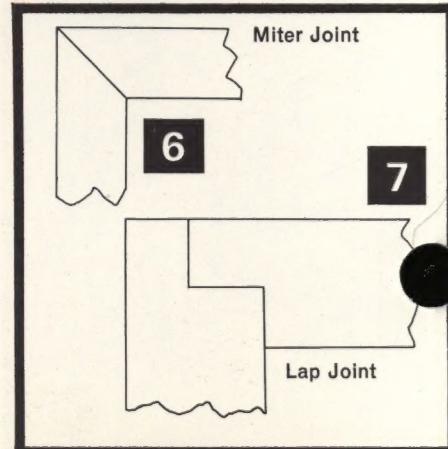
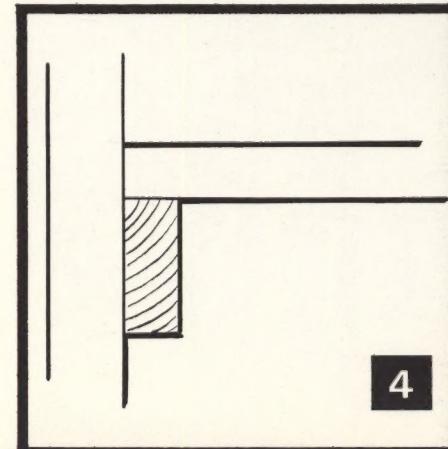
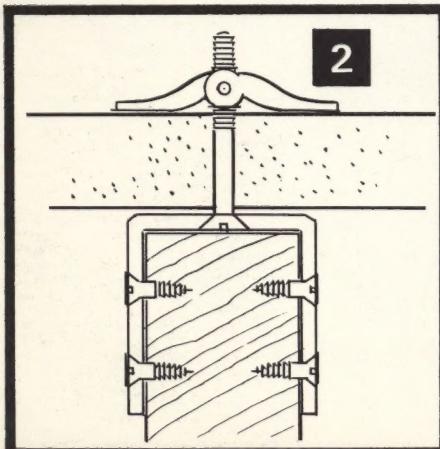
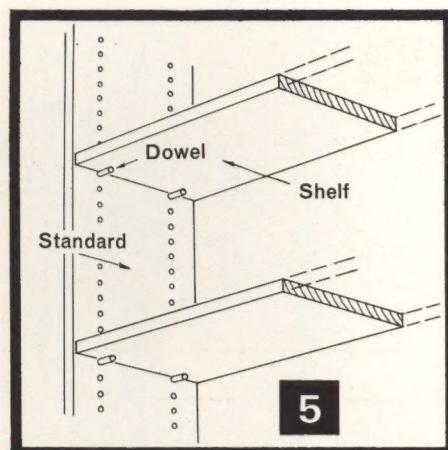
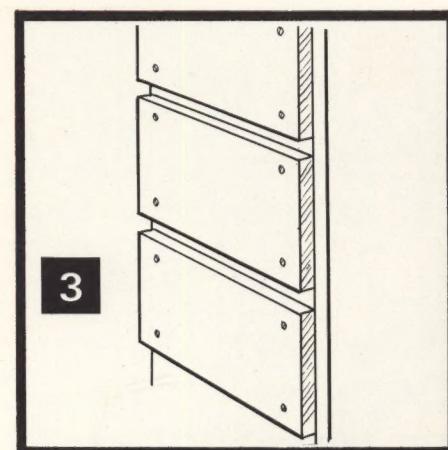
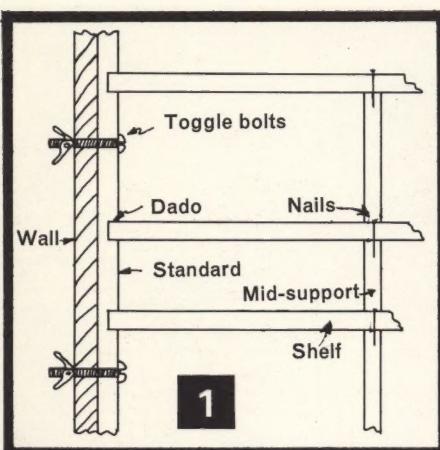
Cleats are another way of supporting permanent shelves and are ideal for rougher types of storage. Sketch 4 shows how they are used. When installing cleats for shelves, bear in mind that the weight to be carried on the shelf is the governing factor in the size of the cleat. Small shelves to hold light weights may be supported on stock as light as  $\frac{1}{4}$ " quarter-round or cove moulding. For heavier weights and broader shelves cleats are practical only if they are made of stock as heavy as 1x2".

If you desire adjustable shelves, an economical way of making them is to drill half-inch holes in the standard and place dowels in them to extend 1" to 2" under the shelf. (See Sketch 5). When you wish to remove the shelves, remove the dowels and re-insert in another row of holes. Drill holes in standards at one or two inch vertical distances.

If your shelves have a long span and may be carrying a fairly heavy load, then supports must be provided. This is usually accomplished by bracing the shelves at midpoint with pieces of lumber cut to fit the space between the shelves. Nail the shelves to the supports.

## 4

### HOW TO BUILD SHELVES



## HOW TO BUILD CABINETS

All cabinets, whether built of fine finish grade lumber and displayed in a formal living room, or built of rough lumber in a basement, have two things in common: a frame and some sort of enclosing material or siding. To this you may add drawers, doors, racks and shelves to suit needs. As a guide here are some construction details for building a simple cabinet using only 1" lumber. Decide on the dimensions you require and cut 1x4" or 1x6" boards to the proper length so they can be edge-glued to form both the siding and frame of your cabinet simultaneously.

A word about gluing. Today's modern resin adhesives have made gluing a simple, strong method of construction. In fact you will find the bond will be stronger than the wood. To edge-glue boards you can either use straight-cut boards and butt them together, or use tongue-and-groove boards. A tongue and groove joint will be stronger because of greater glue area. Try one of the new chemical resin adhesives and spread on both surfaces to be joined. The use of clamps keeps the bond from being disturbed

while the adhesive is setting and therefore assures a tighter joint.

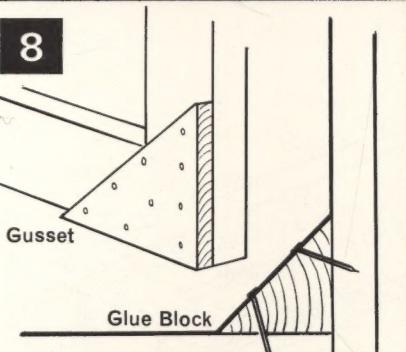
After the glue has set, sand all the surfaces. Join top, sides and back by using a miter or lap joint as indicated in Sketches 6 and 7. Glue all adjacent edges and nail with 6d finish nails. To prevent any movement of the structure while the glue is setting, you may want to use glue blocks or gussets whenever applicable. (See Sketch 8) Countersink the nails and fill with wood putty. Sand flush with surface. If shelves are to be supported by dadoed standards, dado grooves in sides before assembly. Now your basic cabinet—an enclosure—has been completed. Add shelves, racks, drawers and doors to suit.

For a more elaborate unit you can build a complete storage wall as shown in Sketch 9. This unit needs a heavier frame to which the doors are attached. It can be attached to a wall or left as a free standing unit. Details of this storage wall can be used as a guide in building wardrobe or other complex storage units by adjusting basic drawing to size required.

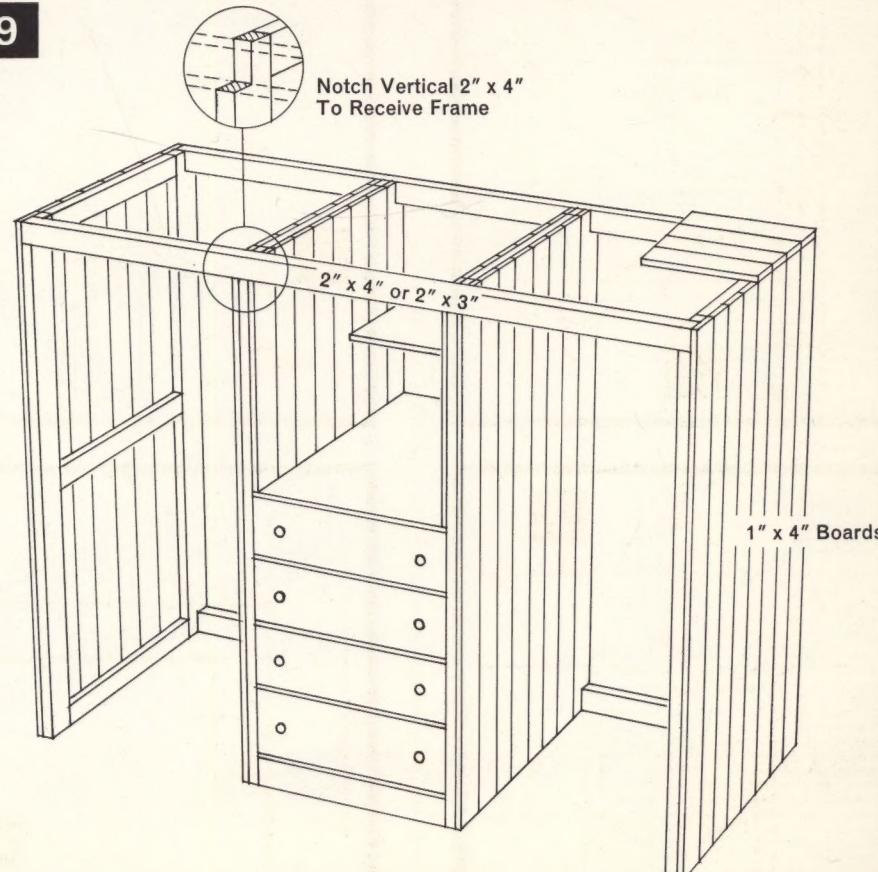
For utmost strength, build framework of 2x4" lumber. Nail end frames to floor, and attach to ceiling with cleats fastened to ceiling by toggle or expansion bolts. Add additional frames as needed to handle your storage requirements. Sketch 9, for example, shows four frames. It's a good idea to plan on using a 2x4" framing member wherever you plan to have a door, particularly a full length door. Cover framing with 1x4" or 1x6" finish grade boards where surface appearance is important. Otherwise use lower grade boards.

Shelving can be either fixed or movable, following details under HOW TO BUILD SHELVING. Next, build a frame for drawers as shown in Sketch 10, using 1x4" lumber for all members. The best method of fastening them together would be to use wood screws and glue. Be sure the bottom rails of frame are in line with each other. Drawers rest on these rails; therefore, they must be exactly level for best drawer operation. Screw drawer frame to sides of cabinet frame members and then build drawers to fit. The following section gives drawer construction details.

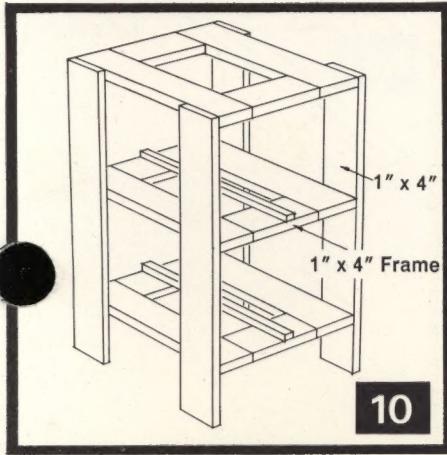
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9



10



Requisites of a good drawer are rigidity and precision. To achieve them, you must measure carefully, cut precisely and assemble exactly. Before actually building, you must make some basic decisions concerning types of drawer construction. You must decide what type of joint to be used, which type of drawer front to install, and what type of guides to use. Here is an explanation of each.

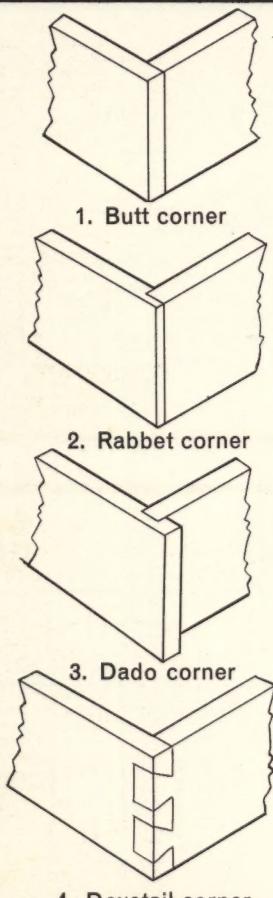
The ends and sides of drawers can be put together in several different ways. The following represent the most usual methods with illustrations of each:

1. Butt corner—simple to make and used where appearance not important; not very strong.
2. Rabbet corner—easily made with hand tools; fairly strong.
3. Dado corner—stronger; neater; better appearance.
4. Dovetail corner—strongest of all; difficult to make; used in finest furniture.

For purposes of illustrating construction techniques, the dado joint has been selected. You may choose the butt or rabbet joint and make the job that much easier.

## 6

### HOW TO BUILD DRAWERS



The front of the drawer can be flush or lipped, that is, with the face extending over the sides of the front. The lipped front eliminates some of the careful fitting and also serves to keep out dust. The illustrations show the lipped front.

Finally, there are two methods of fitting guide strips, which are either attached to the sides or bottom of the drawer to permit easy operation. Each type will be discussed at length.

Here are some drawer techniques: Obtain width and depth of proposed drawer by measuring between frame members. Use 1" thick lumber. Saw front of drawer to a size which allows sufficient overlap to cover framing members. This lip gives the drawer type its name. (See Sketch 11)

Now saw the sides to the desired length. Make the back of the drawer 1" LESS than the actual width of finished drawer. Dado a groove  $\frac{1}{4}$ " deep in each side for back to slip in. Width of groove should correspond to thickness of stock used for back. Remember to make drawer width  $\frac{1}{8}$ " LESS than distance between sides of frame to assure easy operation of drawer. Adapt your sizes to follow basic principles illustrated.

To fit drawer bottom, dado a groove  $\frac{1}{4}$ " wide and  $\frac{1}{4}$ " deep on the inside of each drawer side. This groove is located  $\frac{3}{8}$ " from the bottom of the drawer side and runs parallel to the bottom of the drawer side. Dado a similar groove on the drawer

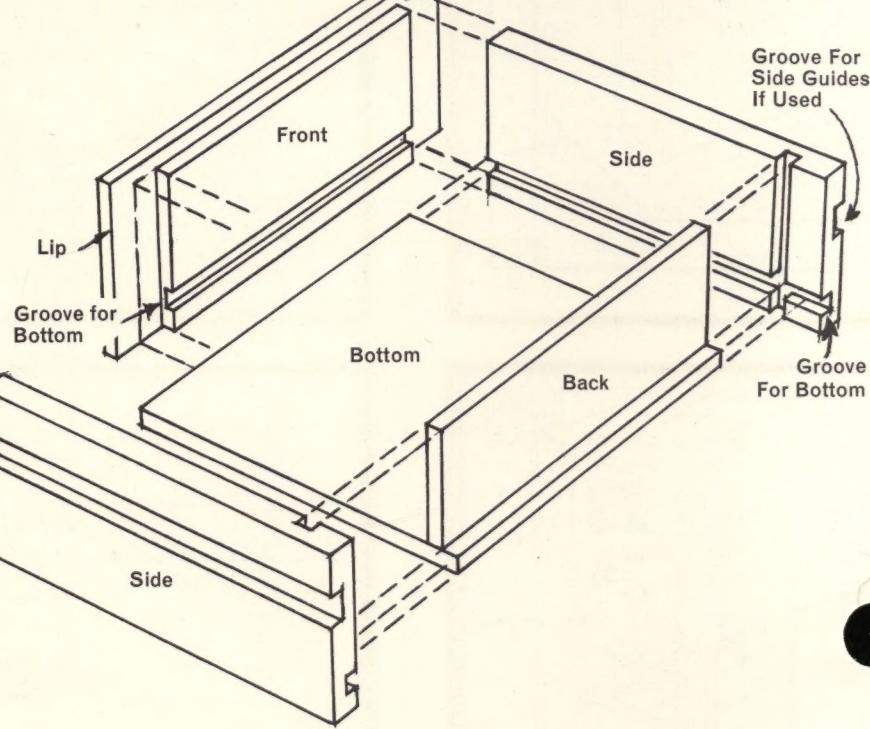
front. (See Sketch 11) This groove holds the drawer bottom. To hold the drawer bottom to the back piece, countersink screws through the bottom into the lower edge of the piece. Use  $\frac{1}{4}$ " thick material for drawer bottom and make it  $\frac{1}{4}$ " longer and  $\frac{1}{2}$ " wider than actual dimensions of drawer. This is to allow for additional material for grooves in sides and front.

There are two methods of fitting guide strips, members which permit easy operation of the drawers. One is a strip that is attached to the side of the frame. To make this type, dado a groove on the outside of both drawer sides, approximately a third of the distance down from the top. Make the groove 1" wide and  $\frac{3}{8}$ " deep. The glide strip attached to the frame should be  $\frac{15}{16}$ " wide. The guide strip on the frame fits into the groove on the sides of the drawer, positions it and guides it in opening and closing. Assemble it with screws and glue to the frame only after the drawer has been constructed so you can check to see that it works without binding.

Another way of making a drawer guide is shown in Sketch 12 and 12A. In this method, two tracks are nailed to bottom of drawer, with a corresponding single guide nailed to bottom of drawer frame, and running from front to back of frame.

Now assemble drawer by gluing and nailing. Screw glide strips in place. Rub paraffin over contact points between guide strips and grooves in frame and drawer. This helps drawers operate smoothly.

## 11



## HOW TO MAKE & HANG DOORS

Doors finish off a cabinet and must be built true and placed straight to work properly and look neat. Match doors to cabinet by using same finish grade and species of lumber in both. Edge-glue boards to attain desired width of door, saw to length, and sand both sides. If no shelves are used on inner surface of door, stiffen with Z-bracing, as in Sketch 13. For rigidity, make sure Z faces hinge as illustrated.

A wide variety of hinges may be used, from those that are completely concealed to those that are completely visible. Which you choose is a matter of personal preference. Before checking your lumber dealer's supply of hinges, remember that various types have different advantages and disadvantages. For example, concealed or semi-concealed hinges do not mar the appearance of the door but require more care in fitting. On the other hand, exposed hinges can be very decorative and can add to the appearance of the door. Properly attached, any hinge does a good job. To keep doors closed, a magnetic latch is easy to install, works with a minimum of pressure and noise, and holds securely.

Sliding doors may be used in a storage wall or cabinet. The simplest way to make them is to construct doors as above (Z bracing not necessary) and fit them with nylon or metal glide wheels on the bottom and top. The cabinet shelves or frame can then be fitted with metal glide rails, countersunk if you desire.

If you do not wish to use the metal hardware, you can build your own door tracks as shown in Sketch 14. Grooves at the top of doors should be deeper than those at the bottom to permit easy removal of doors. Use paraffin on grooves and bottom of doors to facilitate operation. Remember to cut finger grooves in doors for opening and closing. You won't be able to use door handles on sliding doors.

To further increase the effectiveness of your storage unit, you can utilize empty spaces for racks and fit your drawers with dividers. Racks are relatively simple to make, following many of the same principles of shelving previously described, or by using variations of partitions described below.

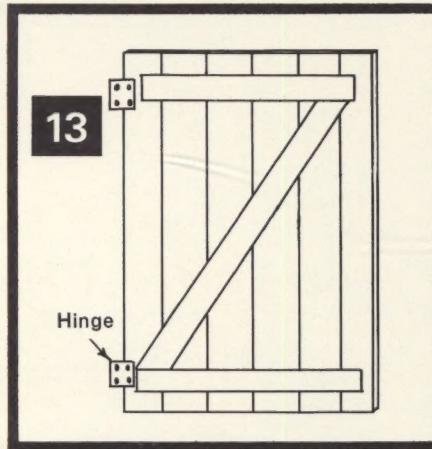
Partitions in drawers assure that your stored articles are readily available, easily seen, and sorted to suit your convenience. They are easily made from  $\frac{1}{2}$ " kiln dried boards. First decide on proper height and saw boards to fit length and width of drawer. Mark point where partitions are to intersect, and saw a notch  $\frac{1}{2}$ " wide and half the depth of the partition as in Sketch 15. Do this at all intersection points on all partitions and slide notched sections together.

The drawer partitions just described are made to butt against the sides of the drawers. Unless they are perfectly fitted, there may be a tendency for them to move. Of course they could be glued, but this would make them permanent. A method of assuring tight partitions, yet easily removable, is to glue small guide strips to the sides of the drawers as indicated in Sketch 16. These are made by notching a  $\frac{1}{2}$ " groove into a piece of 1" half-round moulding.

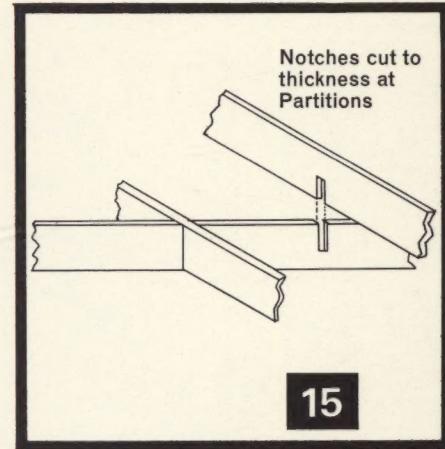
## PARTITIONS & RACKS



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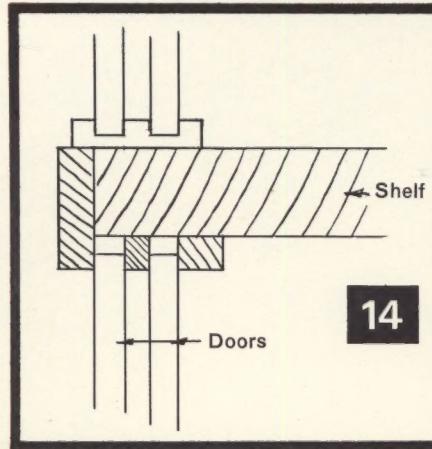
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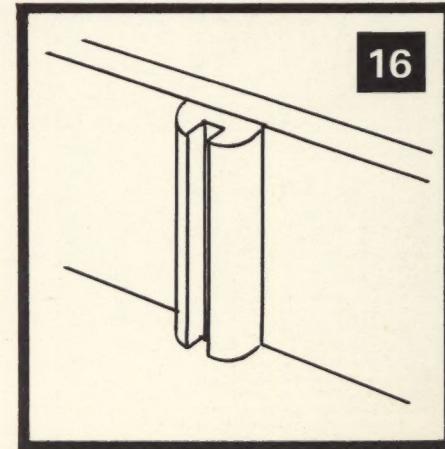
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12A



14



16

## FINISHING HINTS

Most do-it-yourself projects for increased indoor storage can be both functional and decorative. This booklet has dealt mainly with the functional aspects by providing construction techniques. Now some hints on how to make projects more decorative.

### MOULDINGS

One of the earliest materials used to dress up the interior of the home—wood mouldings—is still one of the best. Mouldings come in a tremendous variety of sizes and shapes. Don't be afraid to use them on your storage units to hide joints, cover defects, break up the monotony of drab areas, etc. The list of applications of mouldings is nearly infinite. For more information on use and installation of mouldings, send 10¢ to Western Pine Association, Yeon Building, Portland 4, Oregon, and ask for Booklet No. 444.

### CONCEALING DEFECTS

To have a professional looking surface on your storage units, you will want to hide any poor craftsmanship and defects in the wood. Generally, wood fillers and staining will do the job. The simplest filler is glue mixed with sawdust, but this

is very brittle after drying and can be difficult to work or sand. There are some commercial fillers which can be very useful. They include:

**LINSEED OIL PUTTY**—very pliable; won't fall out of depressions, but has very little strength; two days to dry; should be stained in advance.

**PLASTIC WOOD**—can be bought in wood grain colors; dries quickly; will shrink slightly.

**WOOD PUTTY**—dries in 2 hours without shrinking; dries white so must be stained in advance.

**CAULKING COMPOUND**—surface hardens, but remains flexible underneath; best used in cracks as will fall out of depressions.

One other hint—if you have a dent in the surface, try this technique. Apply damp cloths several hours over the dent to swell the wood fibres. Then apply a warm iron over the cloth.

### STAINING

To allow the natural beauty of the wood grain to show yet impart some color to your unit, you might try staining. You can select a wide variety of stain shades at your dealer's. No skill is needed to apply stain with a brush, since it can be spread in all directions. However, for best results, apply along the grain with an even stroke and in an even quantity. At the end

of each stretch, wipe up the excess with a cloth. This controls color depth and prevents overlaps. As soon as the piece is finished, rub the surface briskly with a clean cloth.

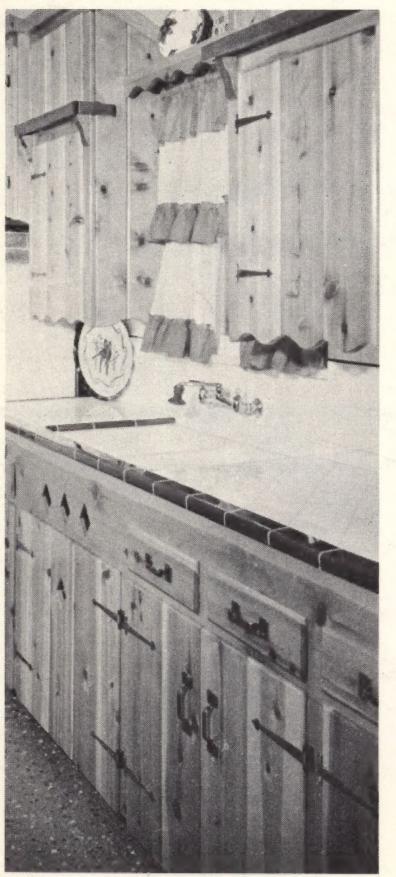
A more recent development in the techniques of coloring wood is the simple process where paint is rubbed into the wood. This produces many exciting colors and shades, yet still leaves the wood grain completely visible. For more complete information on this process send 5¢ to Western Pine Association and ask for Booklet No. 438, "Color on Wood."

### LACQUERING

Use lacquer to preserve the stain and give your unit a clear, hard finish. Apply lacquer quickly with a clean brush and after each coat rub the piece well with fine steel wool using a light touch. Three to five coats are desirable to achieve a beautiful, glossy finish.

### PAINT

For the person who has never attempted the job of finishing furniture, paint is a great equalizer. It hides everything, from blemishes in the wood to a lack of experience on the part of the craftsman. However, wood grain enhances the beauty of the piece and if you are proud of your workmanship—why hide it.



Ask for quality, seasoned lumber manufactured by member mills of  
**WESTERN PINE ASSOCIATION**

■ YEON BUILDING, PORTLAND 4, OREGON

IDaho White Pine ■ Ponderosa Pine ■ Lodgepole Pine  
Sugar Pine ■ Larch ■ White Fir ■ Douglas Fir ■  
Engelmann Spruce ■ Red Cedar ■ Incense Cedar

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